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Combined hormonal treatment for the improvement of summer and autumn fertility of dairy cows

Zvi Roth and David Wolfenson
(תקציב אוניברסיטאי 0396657, 0396646)

Abstract

Fertility of high-lactating cows during the hot season is greatly reduced due to deleterious effects of heat stress on the ovarian pool of follicles and their enclosed oocytes. Various cooling systems are widely used in the dairy farms to alleviate the effects of summer heat stress, resulted by increased milk production similar to that of the winter. Nevertheless, the ability of these cooling systems to prevent the negative effects on reproductive performance is limited. Given the low efficiency of cooling to improve fertility, additional approaches that combine efficient cooling systems with hormonal treatments have been recently suggested. The first approach based on administration of GnRH followed by PGF_{2α} injection to induce three successive follicular waves to increase ovarian follicular turnover. Such administration improved the fertility of subgroups of cows: First AI CR of primiparous cows increased by 16 percentage units and pregnancy rate of cows with high BCS increased by 14 percentage units. The second approach based on insertion of a controlled intravaginal drug-releasing (CIDR) insert containing P₄ in order to support the developing embryo. Results show that CIDR insertion 5 days after AI improved CR of the subgroup of cows with low BCS. Given the differential effects of the hormonal approaches described above we hypothesized that combining these approaches (i.e. to increase follicular turnover and support early embryonic development) might have an accumulative effect and improve fertility in a wider range of cow population. Accordingly, the objective of the present study was to examine whether induction of two follicular waves followed by insertion of a CIDR containing P₄ on d 5 post-AI

(for 14 d) will have additive effect on fertility. As cooling is an essential management in hot climates, the study was carried out in dairy farms equipped with efficient cooling systems. Data were analyzed in relation to potential risk factors associated with reduced fertility, including BCS, parity, postpartum uterine disease, milk yield and SCC.

The findings suggest that administration of successive GnRH-PGF_{2α} injections to increase follicular turnover, followed by a CIDR insert on d 5 post-AI to cooled cows during the summer and autumn improve reproductive performance. The current study confirms our previous findings (Friedman et al., 2011, 2012) that different subgroups of cows benefit most from different hormonal treatments while subjected to intensive cooling management. In particular, cows diagnosed with uterine disease derived the most benefits from combining both hormonal treatments relative to the effects of each treatment separately. Summer reproductive management based on specific treatments to specific designated subgroups of cows might lead to better breeding results and increase the margin between treatment cost and benefit gained.